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## HAULING, DUMPING AND SCREENING COAL.

BY J. L. MITCHELL.

Of the many factors pertaining to the operation of coal mines, the process of hauling, dumping and screening form a very important part, and in a brief manner I proceed to notice them in detail.

1st—In order to haul coal properly, we must have good track, as nearly straight as possible; but if curves cannot be avoided, then let them be curves instead of angles; and all curves in main entry and tram-way tracks should not be less than forty feet radius, thus making it possible to use the wire rope method of hauling, should it be found consistent and advisable to use same at any time; and, judging from the present outlook, based upon actual observations, I predict that it is merely a question of time until the wire rope method

will predominate from the fact that by this method all coal mines will be brought to an equal output; let them be drifts, slopes or shafts, thus enabling all mines to compete in the markets as far as handling coal at the mines is concerned.

At a sufficient distance back of tippie, whatever the capacity of mine requires, there must also be in track a sufficient incline to and from tippie to better facilitate the handling of running cars with as little manual labor as possible.

The automatic switch must also be used to intersect incline mentioned above.

2. We will now take up mining cars for it is as necessary to have good rolling stock as track to improve the method of hauling coal. To be brief I now assert that in ten year's experience I have never as yet seen a practical mining car, although some cars have some very fine mechanical points. Yet some very important points have been overlooked in their manufacture. The majority of car-wheels now in use present a worn-out appearance as soon as they leave the molds. The great hobby as to car-wheels is now the self-oiler, this in itself is quite a point and has made a great improvement in car-wheels; but manufacturers in perfecting the self-oiler, have lost sight of a very important factor, equally as good as the oiler, and that is the flange of the wheel, which on curves is fully as important if not more so. The amount of friction or resistance to be overcome is materially increased or decreased as it may be by the proper or improper shape of the flange. And the best wheel I have seen so far is used by the Motherwell Iron & Steel Works at Logan,

Ohio. Their wheel is self-oiling, with the most proper flange and tread, and as a whole is far superior to any wheel I have seen, and I would advise all parties desiring to improve their rolling stock to try one or a number of their cars, and if not satisfactory it can be returned at the expense of the Company.

The mining car can also be improved by making front end of body some wider than the rear, thus giving free egress to the car while dumping.

3. The next thing in order is the tippie or dumping apparatus. During the last ten years I have put into operation in Hocking Valley and other places, quite a number of tipples known as the Mitchell tippie a device of my own conception, which has been giving general satisfaction as to speed, simplicity and durability, and the fact of their being in use now at the largest and better improved coal mines in the Hocking Valley as well as elsewhere, is a sufficient recommendation for them.

4. The screen next demands our attention, and in order to screen coal as the market demands, it becomes necessary to have the required pitch or elevation. In order that the proper elevation be obtained, all screens should be adjustable. We find by experience that the different seasons of the year require a different elevation or pitch to the screen.

We find by experience to stop coal in the chute against a vertical door after passing over the screen, breaks the coal more or less, and to allow the coal to pass over the screen and deposit in the railroad car without stopping it has a very bad effect on the coal. In order to remove this trouble it's necessary

to have a sufficient chute or pocket that can be used as a weight box should pocket or tippie scales be used. Should the scales not be used the pocket must be hung on rods and made adjustable to accommodate the screens. The bottom of pocket for a space of five feet should be level, the end of the pocket should stand at an angle of 27 deg. from a horizontal line in opposite direction from screens. The level part of pocket that forms the door drops down and deposits the coal in a body, thus preventing the breaking considerably. The height of chute or hopper are generally determined by the location and method for screening the coal—from twenty-four to twenty-eight feet. The proper way to screen the small coals is to elevate and run through revolving screens, which should be so arranged that the coal could be deposited in adjacent bins erected for that purpose. These elevators should be of sufficient height to make such deposits without the aid of additional elevators. We find it well to elevate from thirty-six to thirty-eight feet in height in order to better facilitate the handling of small coals, known as the nut, pea and slack. We would advise parties wishing to improve

the screening of small coals, to call on the Roller Chain Belt Co., Columbus, Ohio, for elevating machinery. We deem it the best in use, from the fact it has given good satisfaction wherever used, if properly set up.

Hoppers or chutes and railroad tracks should be of sufficient proximity to enable all work to be properly and conveniently constructed, but a sufficient distance apart to prevent confliction.

The proper grade or incline of railroad track, to facilitate moving cars to and from the chutes easily, is two feet in one hundred. Cars can be handled on more or less grade, but not as conveniently. The grade depends largely on the location and approach to chutes or hoppers.

In the foregoing I have traversed, briefly, nearly the whole system of handling coal as I now see it. But I hope in the near future to introduce a new system of hauling coal, in which the wire rope will figure largely. My opinion is as to the best method for hauling coal from mines and on tramways is with a wire rope, when properly constructed and located, and a description of some will be given hereafter.

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